



Air Force Research Laboratory|AFRL

Science and Technology for Tomorrow's Air and Space Force

Success Story

WATCH-STANDING STUDY FOR SUBMARINERS PREPARES WAY FOR AT-SEA TRIALS



The US Navy recently enlisted the scientific expertise of the Human Effectiveness Directorate to evaluate the effectiveness of the 18-hour maritime watch-standing schedule adopted in the 1960s. Commanders of the nuclear and fast-attack submarine crews recognized performance challenges and requested an evaluation by the Naval Submarine Medical Research Laboratory (NSMRL) and the directorate's experts on shift work. An initial joint-service study at Brooks City-Base demonstrated that a human-centered, 24-hour schedule could improve submariner circadian physiology and performance.



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Accomplishment

Scientists from the directorate created an alternative 24-hour watch-standing schedule that rotates crews on a 72-hour shift schedule. The schedule provides crews with 6-hour watches and 12-to-24-hour off-duty shifts. The initial study suggests that the alternative schedule increased sleep duration and improved submariner performance during the 18-hour and traditional watch-standing schedules.

Directorate scientists and NSMRL conducted the initial study at the Chronobiology and Sleep Laboratory at Brooks City-Base in Texas. The study aligned the submarine watch-standing cycle with the human body's 24-hour wake/sleep cycle to improve performance. Researchers tested the submarine 18-hour schedule against a traditional maritime 24-hour schedule and the alternative 24-hour schedule.

Directorate scientist Dr. James C. Miller designed the alternative watch-standing schedule. Scientists from the collaboration expect the alternative schedule's at-sea trial to expand upon and confirm the lab-based findings, potentially ushering in a change in the Navy's 30-year watch-standing policy. The schedule can have significant benefits to other settings as well, especially the Command, Control, Communications, Computer, Intelligence, Surveillance, and Reconnaissance teams on the ground who are living and working 24/7 within one fixed site.

Background

Increased technology mandates the 24/7 operations needed for today's fighting forces. However, human biology cannot change on a mandate generating an increased need to attend to and manage the impact of sleep/rest disruptions, schedule shifting, and fatigue. Sophisticated sensors and equipment generate increased information-processing demands for the submariner. These demands require the submariner to perform optimally throughout each watch. Today's combination of sustained operations and optimal performance creates stresses on America's volunteer forces, impairing their performance. This stress adversely affects the quality of life and retention of experienced and highly trained personnel.

Additional information

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTC, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (04-HE-04)